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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,041	02/16/2001	Yoichi Mizuno	0033-0693P	2528
2292	7590	03/05/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			FISCHER, JUSTIN R	
			ART UNIT	PAPER NUMBER

1733

DATE MAILED: 03/05/2004

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 02202004

Application Number: 09/784,041  
Filing Date: February 16, 2001  
Appellant(s): MIZUNO, YOICHI

\_\_\_\_\_  
Andrew Meikle  
For Appellant

**EXAMINER'S ANSWER**

**MAILED**  
MAR 05 2004  
**GROUP 1700**

This is in response to the appeal brief filed January 14, 2004.

**(1) *Real Party in Interest***

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A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

As only one claim is on appeal, no claim groupings exist for purposes of the appeal.

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

**(A) *Listing of Prior Art of Record***

5,503,940	MAJUMDAR	4-1996
5,420,193	MATSUE	5-1995
5,807,918	CARTER	9-1998

***(B) Brief Description of Prior Art of Record***

**Muraoka** substantially teaches the heavy-duty tire construction of the claimed invention, including a chafer component formed of a base rubber component (natural rubber or isoprene rubber and polybutadiene rubber containing syndiotactic crystals), carbon black, sulfur (S), and vulcanization accelerator (A). The reference further teaches that it is desired for the chafer composition to exhibit, among other properties, high durability and high aging resistance.

**Majumdar** is directed to a tire construction in which a bis-imide additive is included in a rubber component, in this case a rubber adhesive component, in order to reduce heat generation, improve durability, and reduce reversion, which is analogous to improved aging resistance. In describing the base composition of the rubber component, Majumdar suggests that it can include natural rubber and various synthetic elastomers (e.g. polybutadiene and polyisoprene).

**Matsue** teaches a heavy-duty tire construction and expressly describes the nitrogen adsorption specific surface area of specific types of carbon black. In particular, the reference recognizes that carbon black N220 and N330 have a surface area between 70 and 120 m<sup>2</sup>/g.

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**Carter** is directed to a tire construction and expressly describes the nitrogen adsorption specific surface area of specific types of carbon black. In particular, the reference recognizes that carbon black N330 has a surface area between 70 and 120 m<sup>2</sup>/g.

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muraoka (US 5,859,142) and further in view of Majumdar (US 5,503,940), Matsue (US 5,420,193), and Carter (US 5,807,918).

Muraoka discloses a heavy-duty tire construction having a chafer component, wherein said chafer comprises (a) carbon black, such as N220 and N330, in an amount between 60 and 75 phr, (b) polybutadiene rubber having a syndiotactic crystal content between 6 and 17% in an amount between 30 and 70 phr, (c) an additional diene rubber, such as natural rubber or isoprene rubber, in an amount between 30 and 70 phr, and (d) sulfur (S) and accelerator (A) in an amount that defines a ratio of S/A between 0.25 and 1.0 (Column 2, Lines 33-60 and Column 4, Lines 4-50). In describing the chafer, Muraoka indicates that high durability and high aging resistance are desired to avoid deformation in the bead, rim chafing, and cracking. The reference, however, is silent with respect to (i) the inclusion of 1,3-bis(citraconimidiomethyl) benzene or BCI in an amount between 0.2 and 0.5 phr and (ii) the BET surface area of the carbon black. Regarding the inclusion of BCI, Majumdar describes the use of bis-imide compounds,

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specifically BCI [Trademark: Perkalink 900], in an amount between 0.1 and 5 phr in tire rubber compositions formed of natural rubber and synthetic rubbers (used as an adhesive) in order to, among other things, improve durability and reduce reversion (analogous to aging resistance) (Column 2, Lines 27-54 and Column 3, Lines 13-21). As such, one of ordinary skill in the art at the time of the invention would have found it obvious to include BCI in the chafer composition of Muraoka, there being a reasonable expectation of success to obtain improved durability and aging resistance in the chafer of Muraoka. As to the surface area of the carbon black, many of the conventional carbon blacks used in the tire industry, including some of those disclosed by Muraoka, have a BET surface area within the broad range of 70-120 m<sup>2</sup>/g, as evidenced for example by Carter (Column 5, Table I) and Matsue (Column 5, Lines 60-67). One of ordinary skill in the art at the time of the invention would have readily appreciated and expected many of the carbon blacks described by Muraoka (e.g. N220 and N330) to have a surface area in accordance to the limitations of the claimed invention, there being no conclusive showing of unexpected results to establish a criticality for the claimed surface area.

Regarding the use of BCI, as previously noted in Paper Number 10, Paragraph 2, anti-reversion agents (additives that improve aging resistance or reduce reversion) in general are conventionally employed in a variety of tire components, especially those containing natural rubber. It is noted that appellant has not challenged the examiner's position that anti-reversion agents in general are conventional additives used in tire rubber compositions. In this same regard, Majumdar describes a specific additive (BCI)

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in a tire rubber composition that functions as an anti-reversion agent and is further described as providing improved durability. It is emphasized that Majumdar specifically attributes the benefits of improved durability and aging resistance to the inclusion of BCI in a tire rubber composition formed of natural rubber and synthetic rubbers. While Majumdar is primarily concerned with a rubber adhesive component disposed between the carcass and the tread, the reference more generally teaches the benefits of BCI when added to a tire rubber composition formed of natural rubber and synthetic rubber. It is noted that the rubber "adhesive" component of Majumdar is nothing more than a base rubber formed of natural rubber and synthetic rubbers and a tackifier (well known tire additive). Majumdar fails to place a criticality on the inclusion of BCI in the specific rubber "adhesive" composition (defined by Majumdar)- the reference more generally recognizes the benefits of including BCI in a tire rubber composition, particularly improved durability and aging resistance. Therefore, in view of the recognized benefits of BCI and the properties desired by Muraoka, one of ordinary skill in the art at the time of the invention would have readily appreciated the employment of BCI in the chafer rubber composition of Muraoka since (a) anti-reversion agents are conventionally used in tire rubber components (position taken in previous action and not challenged by applicant) and (b) said benefits are analogous to the well known and desired properties of chafer rubber compositions, which are expressly detailed by Muraoka.

As to the carbon black, Muraoka suggests the use of carbon black (e.g. N220, N330) in an amount between 60 and 75 phr, which falls entirely within the range of the claimed invention. While Muraoka does not provide the BET surface area for said

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carbon black, many of the conventional carbon blacks disclosed by Muraoka have BET surface areas that fall within the broad range of the claimed invention, as shown for example by Carter (Column 5, Lines 50-65) and Matsue (Column 5, Lines 60-68). In particular, the broad range of the claimed invention defines well-known and extensively used carbon blacks in the tire industry.

**(11) Response to Argument**

Applicant initially argues that there is no clear and particular guidance in the primary reference and the application. In response to this, the examiner points to Muraoka in which a chafer composition formed of natural rubber and synthetic rubber and having high durability and high aging resistance is desired. While Muraoka fails to expressly include BCI, Majumdar recognizes the benefits of improved durability and aging resistance in a tire rubber component as a result of including BCI. One of ordinary skill in the art at the time of the invention would have been motivated to include BCI in the chafer component of Muraoka in order to obtain the above noted benefits, there being a reasonable expectation of success since the rubber compositions of Muraoka and Majumdar are both formed of a mixture of natural and synthetic rubbers. It is noted that the rubber "adhesive" component of Majumdar is nothing more than a base rubber formed of natural rubber and synthetic rubbers and a tackifier (well known tire additive). Majumdar fails to place a criticality on the inclusion of BCI in the specific rubber "adhesive" composition (defined by Majumdar)- the reference more generally recognizes the benefits of including BCI in a tire rubber composition, particularly improved durability and aging resistance.



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It should be noted that the reason for making the combination need not be expressly suggested by the "primary" reference but rather it is what would have been discerned by the ordinary artisan when viewing the prior art as a whole. Here, one clearly would have been motivated to incorporate BCI in the composition of Muraoka in order to further enhance the properties of durability and aging resistance.

Regarding applicant's contention that Majumdar equals an invitation to experiment until the present invention is achieved, it is emphasized that Muraoka desires a chafer rubber composition that is high in durability and aging resistance. It is well known in the tire industry to include additives to a base rubber composition to affect a desired property or mixture of properties. In this instance, Majumdar describes the use of a specific additive (BCI) in a tire rubber composition and directly attributes the benefits of improved durability and aging resistance to the inclusion of said additive. Thus, in view of Majumdar, it is well established that BCI positively affects the durability and aging resistance of tire rubber compositions and as such, the disclosure of Majumdar does not merely represent an invitation to experiment. In particular, Majumdar is not directed to a wide variety of additives that have potential benefits wherein one of ordinary skill in the art at the time of the invention would have been required to perform a great deal of experimentation to reach the composition of the claimed invention- the reference expressly recognizes the benefits of a particular additive (BCI) in a tire rubber composition, said benefits being analogous to those desired by Muraoka. Thus, it is not simply the advantages described by Majumdar but rather a comparison of these advantages with those expressly desired by Muraoka.

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Regarding appellant's hindsight position, the appellant is advised that there can be no hindsight where there was express reasoning as to why the teachings would have been combined. In this instance, Muraoka desires a chafer rubber composition having high durability and aging resistance. Majumdar, on the other hand, expressly teaches the inclusion of BCI in a tire rubber composition formed of natural and synthetic rubbers to provide enhanced durability and aging resistance. Thus, one of ordinary skill in the art at the time of the invention would have been motivated to include BCI in the composition of Muraoka, particularly since the desired benefits of Muraoka are provided by the additive described by Majumdar.

As to applicant's argument that the rejection is based on an improper combination of references based on inconsistent features, the examiner agrees that the chafer rubber component of Muraoka is different from the tire rubber "adhesive" component of Majumdar. However, in each instance, the references are directed to a tire rubber component formed of a mixture of natural and synthetic rubbers. In particular, Majumdar recognizes the use of BCI for the benefits of improved durability and aging resistance. There is no evidence in Majumdar, however, of any criticality relating to the use of BCI in the specific rubber "adhesive" composition of Majumdar. More generally, Majumdar recognizes the benefits of BCI in tire rubber components, it being noted that the rubber "adhesive" composition of Majumdar is an extremely similar rubber composition as compared to that of Muraoka (only difference is express teaching of tackifier in Majumdar). Additionally, the rejection set forth above does not rely on the obviousness of using the rubber "adhesive" composition of Majumdar in Muraoka but

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rather relies on the use of an individual additive recognized by Majumdar as providing improvements in durability and aging resistance.

Regarding the results of Tables 3 and 4, applicant contends that the claimed invention has achieved the unexpected results of improving rim slippage resistance, creep resistance, and toe-cracking resistance. These properties are all related to the deformation of the bead during mounting and running of the tire (See Original Specification: Page1, Line 22+). It is noted that Muraoka similarly recognizes that bead deformation is a phenomenon that occurs in tires and further suggests that the inventive chafer rubber compositions provide high durability and high aging in order to prevent occurrence of bead deformation (Column 1, Lines 25-32). Thus, Muraoka recognizes the use of substantially the same chafer rubber composition as the claimed invention to eliminate similar problems resulting from bead deformation. As such, the above noted results (of the claimed invention) are not seen to constitute "unexpected results".

Furthermore, as to the specific results of Tables 3 and 4, applicant argues that a criticality has been demonstrated regarding the S/A ratio, wherein improvements in strength at break, elongation at break, hardness, and hysteresis are realized.

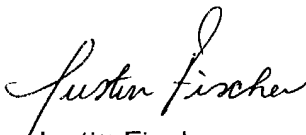
Regarding this issue, Examples 8-10 are inventive examples while Examples 7 and 11 have a ratio that falls outside the claimed invention. Contrary to applicant's statements, Example 11, which has a S/A ratio of approximately 0.22, actually shows the lowest hysteresis and the highest hardness. Additionally, Example 7, which has a S/A ratio of approximately 0.66, actually shows the highest strength at break and the highest elongation at break. Thus, the data of Tables 3 and 4 do not provide a conclusive

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showing of unexpected results to establish a criticality for the S/A ratio. It is further noted that Muraoka specifically suggests an S/A ratio between 0.25 and 1.0, which encompasses the entire range of the claimed invention. Lastly, it is recognized that some of the inventive examples incorporating BCI demonstrate better aging properties (in comparison to comparative examples); however, these results are not unexpected in view of Majumdar, which expressly attributes the benefits of improved durability and aging resistance to the use of BCI in a tire rubber composition.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Justin Fischer  
February 23, 2004




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